

Revised Polychlorinated Biphenyl Abatement Plan

For the Site:

The Learning Resource Center
Worcester State University
486 Chandler Street
Worcester, MA. 01602-2597

Prepared for:

Worcester State University

C/o Universal Environmental Consultants
12 Brewster Road
Framingham, MA. 01702

Prepared by:

Lord Associates, Inc.
1506 Providence Highway, Suite 30
Norwood, MA 02062

Project No. 1826

June 14, 2012

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1.0 Introduction:

1.1 Purpose & Background:

Pursuant to 40 CFR 761.61(a), and (c), and 761.79 (h) of the Toxic Substances Control Act (TSCA), Lord Associates, Inc. (LAI) is submitting this Revised Polychlorinated Biphenyl (PCB) Abatement Plan for the site referred to as the Learning Resource Center at Worcester State University in Worcester, Massachusetts (the "Site"). The need for the Abatement Plan was triggered by the identification of PCBs in exterior window caulking in preparation of a planned building renovation. This Revised plan incorporates all EPA comments and conditions provided in their April 11, 2012 Conditional Approval letter.

The Site is located within the campus of a public university in a mixed-use suburban setting located in Worcester, Massachusetts. The subject building serves as the college library and resource center. The present structure was built in 1968. A Site Locus is presented in **Figure 1**.

In planning for the renovation of the building, the University contracted with the architectural firm Lamoureux Pagano Associates of Worcester, Massachusetts to create the new design. To prepare for the work, Universal Environmental Consultants (UEC) was hired to collect representative samples of building material likely to be affected. Based on the construction history of the building, it is likely that similar caulk was used to seal all windows in the building. Therefore, in November of 2011, UEC collected three samples of existing window frame caulk for the analyses of PCBs. Concentrations of PCB Aroclor 1260 in excess of 50 milligrams per kilogram (ppm) were detected in the three samples collected. Subsequent sampling of adjacent masonry indicates that PCBs less than 1 ppm may be present. No PCBs were detected in soil underneath the windows.

The Abatement Plan proposes to remove all windows with PCB containing caulking for off-site disposal as a "bulk-product waste". The windows will be replaced with a new design and the entire building will be enclosed within aluminum overcladding.

1.2 Contact Information:

The following information pertinent to the persons assuming responsibility for conducting the Abatement Plan (i.e., the Potentially Responsible Party, PRP) is provided as follows:

PRP Contact Information:

Name:	Worcester State University, c/o Sandra K. Olson
Address:	486 Chandler Street, Worcester, MA. 01602
Relationship:	Director of Facilities
Telephone:	508-929-8052

Environmental Consultants/Licensed Site Professional Information:

Name: Ralph J. Tella, Lord Associates, Inc.
LSP#: 7473
Address: 1506 Providence Highway, Suite 30, Norwood, MA.
Telephone: (781) 255-5554 x14

2.0 Site Description:

2.1 Building Description

The Learning Resource Center building is a three-story masonry and steel structure of approximately 46,000 square feet. It features a unique circular design surrounded with a concrete apron (see **Figure 2**, Aerial Photograph). The building was constructed on the slope of a hill, such that the first floor is only partially exposed, and features a few small windows near the entrance. Under these windows is located a small gravel and grassed landscaped area approximately 40 feet in length (see photographs in **Appendix A**).

2.2 Land Use and Surrounding Receptors:

The property on which the Learning Center building is located is a college campus within a primarily suburban area along Chandler Street. The University provides both undergraduate and graduate education. Current and foreseeable future use is similar as a library and learning resource center. Potential receptors include students, visitors, faculty and staff. There are no adjacent surface water bodies, wetlands, or critical wildlife habitats.

2.3 Nature and Extent of PCB Contamination:

Representative samples of window frame caulking were collected by UEC on November 10, 2011. See **Figures 3 & 4** for the locations of these samples. Each of the samples appeared to be the same bronze-colored caulk material. The samples were extracted via EPA Method 3540C and analyzed via EPA Method 8082 by EMSL Analytical, Inc. These results indicate that PCBs in the form of Aroclor 1260 are likely present at concentrations greater than 50 milligrams per kilogram (mg/kg), or roughly parts per million (ppm) in the exterior window caulk used throughout the building. On May 8, 2012, three samples of window glazing were collected for PCB analyses. Samples from the first floor Room 104 and second floor Stair C were found to be >50 ppm (1,000 & 950 ppm, respectively). A sample from the second floor Room 210 was <50 ppm (6.2 ppm). Copies of these lab reports are provided in **Appendix B**.

To determine if the PCBs in the exterior window caulking had leached into the adjacent building materials, samples of interior block and exterior brick located immediately adjacent to the windows were collected by UEC on December 14, 2011 and February 7, 2012 by manual chiseling (see photographs in **Appendix A**). The samples were extracted via EPA Method 3540C and analyzed via EPA Method 8082 by EMSL Analytical, Inc. These results indicate that PCBs in the brick samples collected immediately adjacent to the

caulk were present at concentrations less than 1ppm. No PCBs were detected in the interior block sample or the brick samples collected at a distance of 3-4 inches from the caulk. Please note that no interior caulk was identified.

To determine if PCBs had leached from the caulk onto adjacent soil located below the windows, three samples were collected from the top few inches below the gravel and grass. Note that the majority of the area underneath the windows is a concrete surface. The results of the analyses were that no PCBs were detected in the soil. Copies of the original lab reports are provided in **Appendix B**.

Table 1
Summary of PCB Analyses
Mg/Kg, dry weight

Sample ID	Date	Material	Location	Aroclor 1260
1	11/10/2011	Caulk	Window Frame, Upper	23,000
2	11/10/2011	Caulk	Window Frame, Upper	25,000
3	11/10/2011	Caulk	Window Frame, Lower C small window	54,000
1	2/07/2012	Exterior Brick	Room 136B	0.65
2	2/07/2012	Interior Brick (block)	2 nd Floor stair C	<0.50
3	2/07/2012	Exterior Brick	2 nd Floor stair C	<0.50
4	2/07/2012	Exterior Brick	Room 219	<0.50
5	2/07/2012	Exterior Brick	2 nd Floor stair B	<0.50
6	2/07/2012	Interior Block	2 nd Floor stair B	0.72
1	12/14/2011	Exterior Brick	@3 rd 2 nd Floor stair B	<0.61
2	12/14/2011	Exterior Brick	@4 th 2 nd Floor stair B	<0.61
1	12/26/2011	Soil	By Loading Dock	<0.650
2	12/26/2011	Soil	Right of lower entrance	<0.650
3	12/26/2011	Soil	Left of lower entrance	<0.650

3.0 Abatement Plan

3.1 Plan Objectives:

The objectives of this Abatement Plan are to properly remove all materials identified as PCB containing bulk material for off-site disposal. The cleanup goal for any PCB remediation waste identified or generated will be <1.0 ppm.

There are twenty-nine windows that will be removed under this Plan. With the exception of four smaller windows located on the lower floor that are 2'x7' in size, all are 3'6" x 20'. Caulking was used on all four sides. The exterior will be fitted with aluminum overcladding.

3.2 Work Plan:

3.2.1 PERMITS AND COMPLIANCE:

- A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.
- B. The Contractor shall submit to the Consultant and University the plan for managing the waste including all collection, storage, disposal and decontamination practices/waste disposal at least seven days prior to commencement of work.
- C. Perform PCB related Work in accordance with EPA Regulations at 40 CFR 761.1 (Toxic Substances Control Act), MADEP Hazardous Waste Regulations 310 CMR 30, OSHA Regulations at 29 CFR 1910.1000, as specified herein. Where more stringent requirements are specified, adhere to the more stringent requirements.
- D. The Contractor must maintain current certificates of training, licenses or registrations pursuant to OSHA, MADEP and EPA regulations for all Work related to this Project, including the removal, handling, transport, and disposal of hazardous and industrial waste.
- E. The Contractor shall be prepared to obtain an EPA ID number if so directed by the Owner.

3.2.2 WORK AREA PREPARATION:

- A. PCB caution signs shall be posted at all approaches to the PCB Work Area. Post all emergency exits as emergency exits only on the Work Area side, post with PCB caution signs on the non-Work Area side. Provide all non-Work Area stairs and corridors accessible to the PCB Work Area with warning tapes at the base of stairs and beginning of corridors. Warning tapes shall be in addition to caution signs.
- B. Access to areas of work shall be enclosed with a temporary fence and regulated to prevent unauthorized visitors.
- C. For Exterior Removal:
 - 1. All ground surfaces exterior to the work area shall have a layer of 6 mil polyethylene sheeting, continuously attached to the building face and laid down on the surface below the exterior abatement work area, at least 10 feet wide or to the furthest point of gravity fall for dislodged debris by methods used, whichever is further.
 - 2. All operable windows within the work area and 25 ft. from all sides of the work area shall be closed.
 - 3. At window opening isolate HVAC equipment intakes by installing plastic sheeting over the opening to minimize creating airborne dust inside the building.

4. All window openings within the work area will be sealed from the interior of the building with plastic sheeting.

D. Total Dust Monitoring:

1. Place total dust monitor recording devices at fence line of work area. One monitor to be placed upwind and two downwind, to triangulate the work area.
2. Record PM10 particulates on hourly basis, minimum.
3. Action limit is EPA Daily PM10 National Air Quality Standard of 150 ug/100M³. If the action limit is exceeded, work will cease and engineering controls implemented to limit the generation of dust such as water misting or vacuuming.

3.2.3 REMOVAL OF PCB MATERIALS:

- A. PCB-containing materials (window systems) shall be removed in accordance with the Contract Documents and the approved PCB Work Plan.
- B. Non-PCB items such as adjacent masonry from which PCB materials are removed shall be decontaminated by physical or chemical means (such as stripper) such that no *visible* residue remains. The removal of the PCB materials may require the use of scrapers, solvents, mastic removal chemicals, or other methods/procedures to ensure complete removal. Post abatement verification sampling will be done on these surfaces in accordance with **Section 3.4.1** of this Plan.
- C. Mechanical cutting or grinding of PCB materials is not permitted, unless the equipment has factory- equipped HEPA filtered exhaust.
- D. If window frame cutting is necessary for removal, remove accessible glazing/caulking that could be disturbed before cutting building components.
- E. All removed PCB material shall be placed into 6 mil plastic disposal bags or other suitable container upon detachment from the substrate. Large components with PCB material or PCB residue shall be wrapped in one layer of 6 mil polyethylene sheeting. Sharp components likely to tear disposal bags shall be placed in fiber drums or boxes and then wrapped with sheeting.
- F. Power or pressure washers are not permitted for PCB removal or clean-up procedures.
- G. All construction and demolition debris determined by the Environmental Consultant to be contaminated with PCB shall be handled and disposed of as PCB waste. If the 40 CFR 761 Subpart S double wash-rinse technique is used to decontaminate non-porous surfaces such as movable equipment, tools, and sampling equipment, sampling is not required and the material may be considered non-PCB.
- H. All PCB waste (windows) must be located at or near the point of generation, under the control of the Project Supervisor. The waste will be moved the same day of generation to a Container

Storage Area (CSA) or off-site. Waste may be stored at the CSA for 90 days, during which labeling, inspections, and other requirements must be met as described in 40 CFR 761.

- I. Closure of the CSA. If an EPA ID number and CSA were created specifically for the PCB removal work, the Contractor must also close out the CSA and the Consultant shall notify the MADEP that the hazardous waste activity has concluded, and that the storage area is to be closed.
- J. Personal protective equipment, including respirators, shall be utilized and worn during all removal operations until the Work Area is cleared by the Abatement Project Monitor (APM).
- K. Following completion of each shift and during active work, the exterior poly sheeting will be cleaned of visible debris and replaced as necessary. The decontamination procedures in **Section 3.2.4** shall be followed.

3.2.4 EQUIPMENT AND AREA DECONTAMINATION:

- A. When removal of PCB materials is completed, the decontamination process shall consist of vacuuming (with a HEPA filter), wet wiping/mopping and a repeated vacuuming (with a HEPA filter) of the entire work area. All ground cover and adjacent building surfaces in and around the work area must be free of dust generated during the work.
- B. Decontaminate all movable tools and equipment before removal from the work area in accordance with 40 CFR 761 Subpart S double wash-rinse technique. The contractor work plan will specify decon procedures, where the decon area will be located, as well as any decon waste generated stored.
- C. Based on visual observation, if dust or debris has migrated through the dust barriers to areas of the building other than the immediate work area, those areas shall be incorporated into the work area and thoroughly decontaminated to ensure all visible dust generated by the activity is eliminated.
- D. Dust barriers and other protective sheeting shall be placed in disposable construction bags and disposed of as PCB Remediation Waste.
- E. Visually inspect the area for any remaining dust or debris. Vacuum (with HEPA filter) and wet wipe until space is clean. Dispose of vacuum contents as PCB Remediation Waste.
- F. Upon completion of decontamination and removing temporary dust barriers, a final inspection shall be performed by the Contractor and APM.

3.3 Schedule:

Planning work will commence once EPA approval is obtained. A definitive work schedule will be prepared once the project has been successfully bid and awarded.

3.4 Quality Control and Assurance Plan:

3.4.1 Post Abatement Verification Sampling:

Following the removal of all PCB Material, a visual inspection of the work site area will be performed to verify the removal of all such visible (caulk) material and to collect confirmatory samples from the area for laboratory analyses. Samples will be collected from adjacent material substrate using the EPA Standard Operating Procedures for Sampling Porous Surfaces for PCBs (See **Appendix C**) at a maximum depth of 0.5 inches, placed in zip-lock bags and delivered to the lab under chain-of-custody protocol for confirmatory analyses.

The collection of verification samples will be at the following frequencies:

Large Windows (3.5' x 20'): The minimum verification sampling frequency for decontaminated large windows porous surfaces (i.e., brick) shall be 4 samples per window (approximately 1 sample per 12 linear feet) for the first 5 large windows located at the Site (20 samples minimum).

- a. Verification sampling shall be collected at locations not previously sampled during the prior characterization work.
- b. If all PCB sampling results from this initial sampling are < 1 ppm, WSU may use the following alternate verification sampling scheme for the large windows for the remainder of the project. The alternative scheme requires, at a minimum, the collection of at least 1 brick verification sample per window (total 20 samples, minimum).
- c. In the event any verification sample that is collected using the alternative sampling scheme exceeds the PCB cleanup standard, WSU shall contact EPA within 72 hours for a determination on the appropriate verification sampling frequency for the remaining large window porous surfaces. Alternatively, WSU shall continue to use the initial confirmatory sampling frequency for the remainder of this project.

Small Windows (2' x 7'): The minimum verification sampling frequency for decontaminated porous surfaces shall be 2 samples per each small window (total 8 samples). Verification samples shall be collected at locations not previously sampled during the prior characterization work.

Wipe and Indoor Air Sampling

To determine if residual dust or particles impacted by PCBs have migrated beyond the work area, wipe and indoor air samples will be collected from 10% of each room type (e.g., 10% of all common library areas, 10% of all classroom or instructional areas, 10% of stairwells, etc.). The exact number of samples will be determined.

Wipe samples will be collected from a desk top in the approximate middle of the floor in each room, or if the room is empty, the floor. The method of wipe sampling will be as specified in 40 CFR 761, Subpart P. EPA Method TO-10A will be followed for the collection of indoor air samples.

A cleanup standard of <1 ug/100 cm would be used for wipe samples and 450 ng/m³ for indoor air.

Soil Sampling

Following the completion of the caulk and window removal, bulk PCB remediation waste samples (i.e., soils) shall be collected on a bulk basis and results reported on a dry weight basis (i.e., mg/Kg). Samples shall be collected beneath each window where PCB caulk with >- 50 ppm was located. Samples will be collected within 6 inches of the building and at a 0-3-inch sampling depth.

3.4.2 Laboratory Methods & Associated QA/QC

The subcontracted laboratory will be National Environmental Laboratory Accreditation Program (NELAP) certified and follow EPA Method 3540C for soxhlet extractions and Method 8082 for gas chromatography analysis. A blind duplicate sample will be submitted at the 10% level. Intra-laboratory QA/QC data including matrix spike recovery and duplicates will be reported. Any exceptions will be discussed in a lab report narrative.

All reported data will be validated for Precision, Accuracy, Representativeness, Completeness, Comparativeness, and Sensitivity (PARCCS). In lieu of established QA/QC parameters for caulk, brick, and mortar, the following accuracy and precision parameters for soil will be used to evaluate these data:

Analyte	Matrix	Analytical Method	Reporting Limit	Precision (RPD%)	Accuracy (% LSC rec)
Aroclor 1016	Soil	8082	500 µg/Kg	50	38-158
Aroclor 1221	Soil	8082	500 µg/Kg	50	38-158
Aroclor 1232	Soil	8082	500 µg/Kg	50	38-158
Aroclor 1242	Soil	8082	500 µg/Kg	50	38-158
Aroclor 1248	Soil	8082	500 µg/Kg	50	38-158
Aroclor 1254	Soil	8082	500 µg/Kg	50	38-158
Aroclor 1260	Soil	8082	500 µg/Kg	50	38-158

3.5 Contingency Plan:

In the event that concentrations of PCB bulk waste > 50 ppm is identified in remaining building materials following the post-cleanup quality control sampling, that material will be marked for additional cleanup (i.e., removal) in accordance with the objectives of the Plan.

In the event that concentrations of PCB remediation waste >1 ppm is identified in remaining building materials following cleanup, that material will also be marked for additional cleanup (i.e., removal) if it is easily accessible and feasible to do so. WSU may also conduct additional decontamination to achieve the

required standard. In the event that the PCB decontamination standard cannot be met, WSU shall submit its plan to address the PCB contamination in accordance with 40 CFR 761, and conditional approval item #16.

No masonry is planned for removal as the new design calls for inclosing the entire exterior of the building with aluminum siding. In that event, encapsulation would be used to address the contingency and both a long-term monitoring plan and deed notice would be used per 761(c). WSU shall provide EPA notice of this Plan modification at least ten days prior to such change.

In the event that PCBs are identified at >- 1 ppm in soils, WSU shall be required to submit a plan to address the PCB contamination in accordance with 40 CFR 761, and conditional approval item #16.

4.0 Remedial Waste Management:

All PCB material removed for off-site disposal will be managed in accordance with **Section 3.2.3** of this plan until transported to the approved disposal facility. While on-site, the waste containers shall be labeled with PCB warning labels as specified at 40 CFR 761.40 & 45. The waste containers will be transported under a Uniform Hazardous Waste Manifest by a MADEP licensed transporter, and marked "Polychlorinated biphenyl, solid mixture UN 3432", in accordance with DOT 49 CFR Parts 171 and 172.

- All PCB Bulk Product Waste (e.g., windows) will be disposed of at a RCRA Subtitle C facility approved to accept TSCA waste.
- Any building materials or decontamination wastes identified as PCB Remediation Waste will also be disposed of in the roll-off containers used for the disposal of Bulk Product Waste.

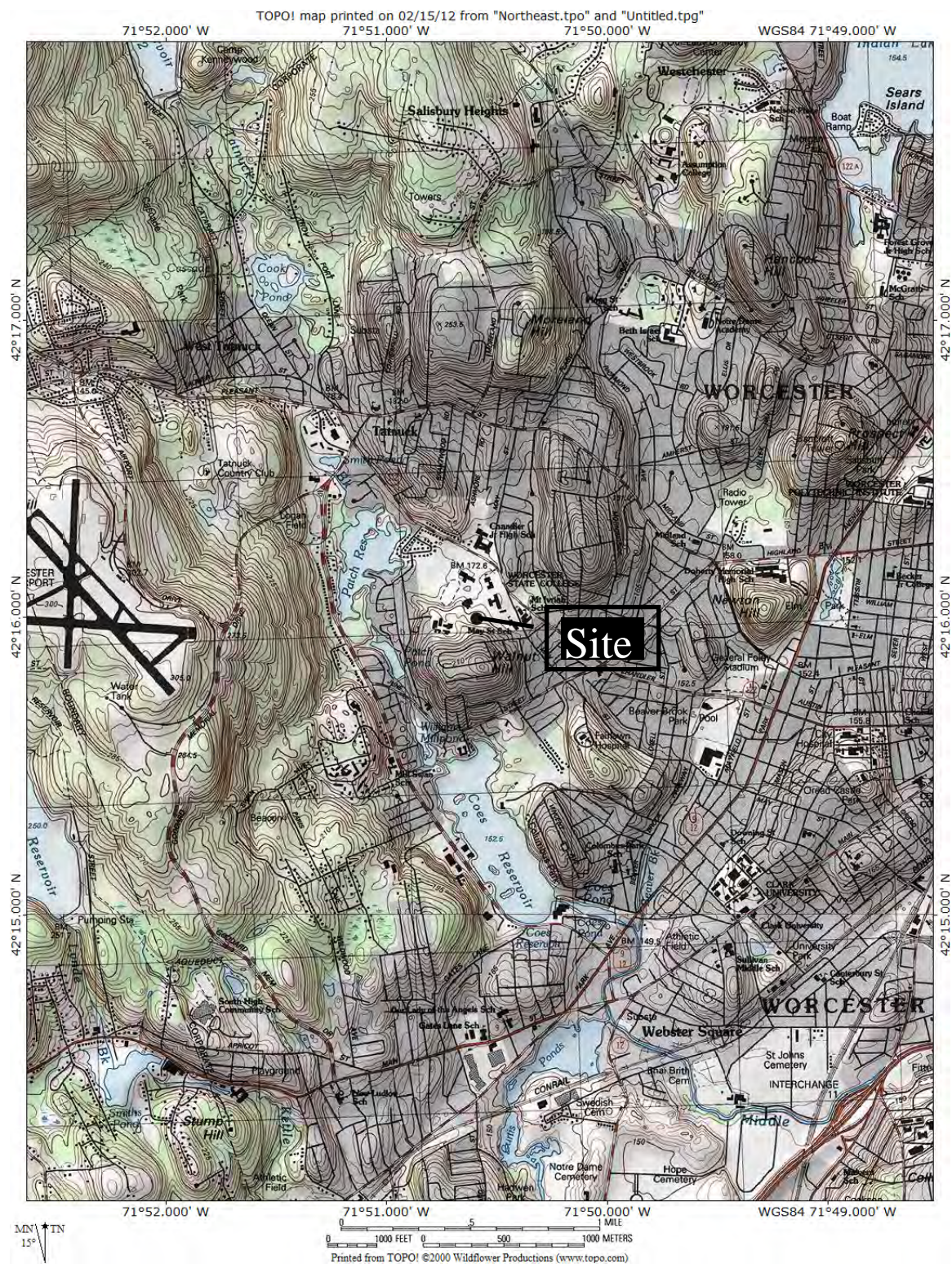
5.0 Maintenance and Monitoring:

No continuing maintenance or monitoring will be required.

6.0 Notifications and Public Involvement:

Public notification of remedial work will be made to the University, Board of Health and Building Inspector Department at least one week in advance.

FIGURES



LORD ASSOCIATES, INC.

1506 Providence Highway, Suite 30
Norwood, MA 02062-4647
(781) 255-5554

REFERENCE:

USGS TOPOGRAPHIC MAPS
Worcester QUADRANGLE
CONTOUR INTERVAL: 3 METERS

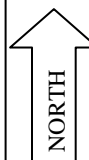


FIGURE 1: LOCATION MAP

486 Chandler Street
Worcester, MASSACHUSETTS



LORD ASSOCIATES, INC.

1506 Providence Highway, Suite 30
Norwood, MA 02062-4647
(781) 255-5554

REFERENCE:

Google Earth

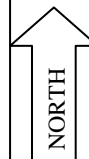
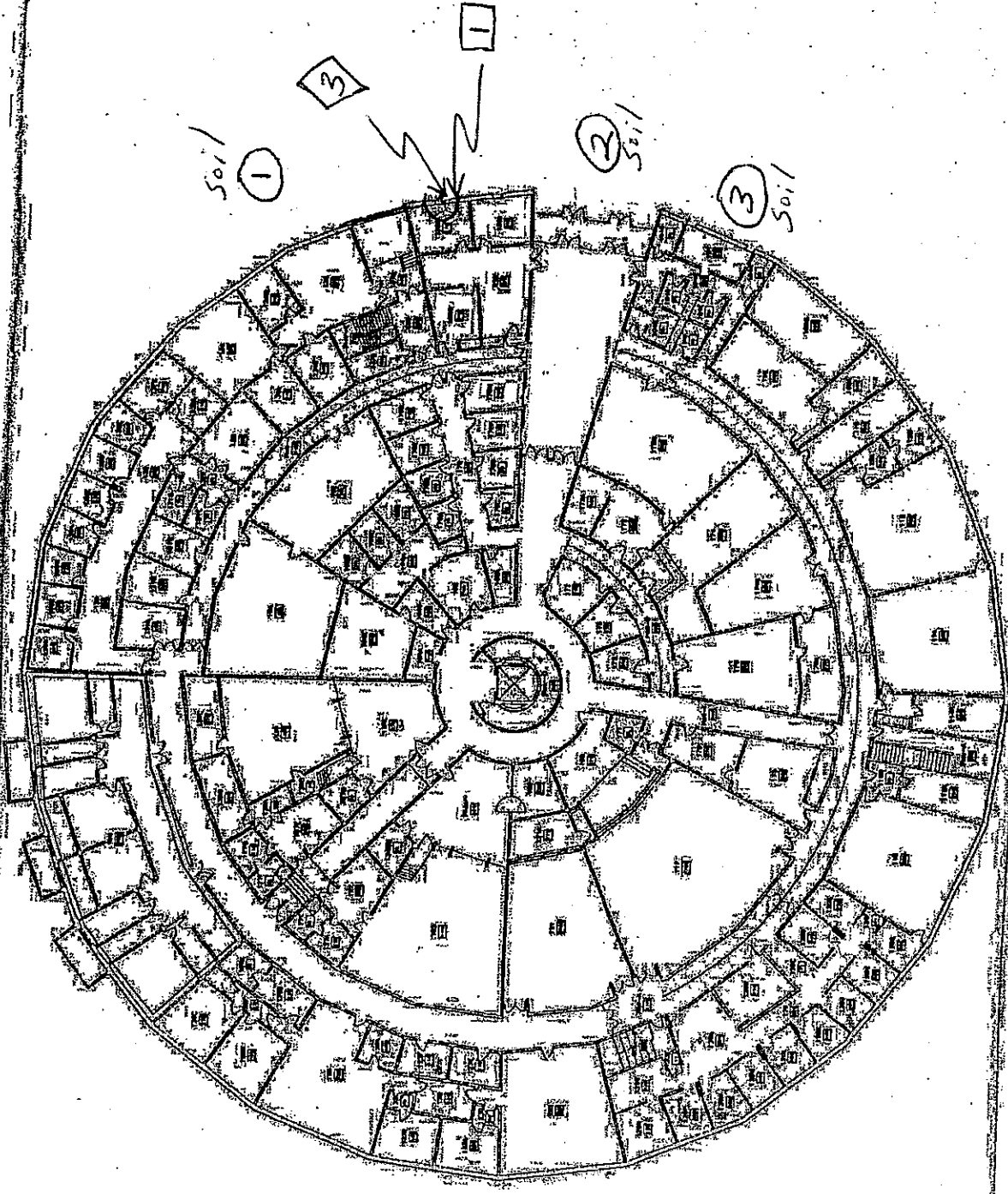


FIGURE 2: Aerial Photograph

486 Chandler Street
Worcester, MASSACHUSETTS

- ◇ 11/10/2011
- ⑤ 12/26/2011
- 2/7/2012



WSL-LRC - First Floor
Figure 3

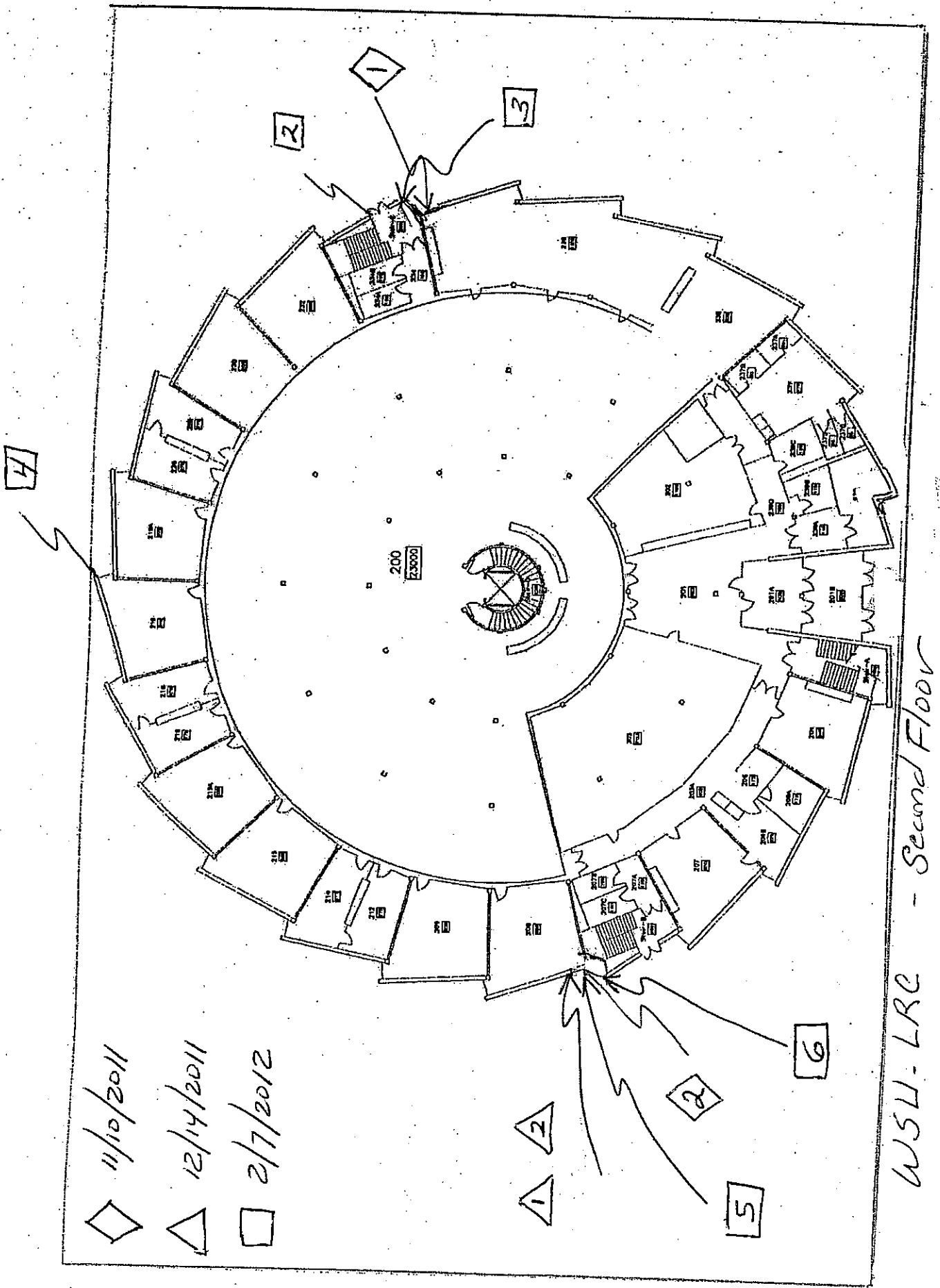


Figure 4

APPENDIX A



Photo #1:	View of Front of Building, west
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Photo #2:	View of Window Front-typical
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Photo #3:	Soil right of lower entrance
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Photo #4:	View of typical Interior Brick
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Photo #5:	View of Soil, Left Side of Lower Entrance
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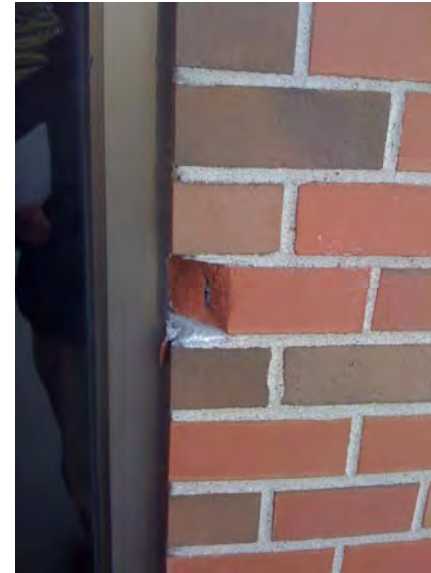


Photo #6:	View of Brick Sample Location, #1-2-7-12
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Photo #7:	View of Brick Sample locations 12-14-11
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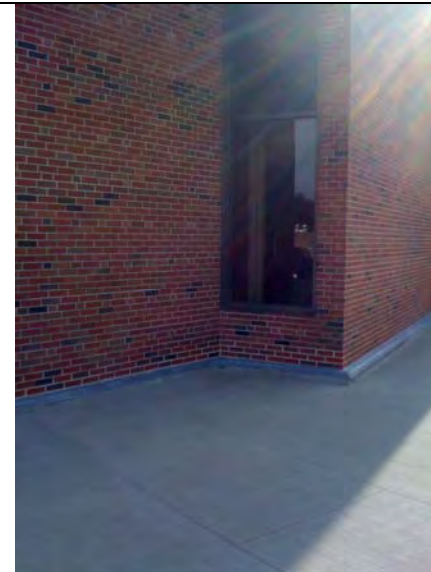


Photo #8:	View of second floor window, typical
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APPENDIX B

EMSL Analytical, Inc.

<http://www.emsl.com>

3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: (856) 858-4571

EMSL

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488

11/22/2011

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 11/14/2011. The results are tabulated on the attached data pages for the following client designated project:

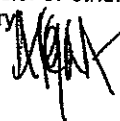
Worcester

The reference number for these samples is EMSL Order #011105790. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:



Julie Smith - Laboratory Director or other approved
signatory



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.

NELAP Certifications: NJ 04653, NY 10896, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Fax: (508) 628-5488

Phone: (508) 628-5486

Project: **Worcester**

Customer ID: UEC63

Customer PO:

Received: 11/11/11 11:00 AM

EMSL Order: 011105790

Analytical Results

Client Sample Description		1	Collected:	11/10/2011	Lab ID:	0001
		window frame caulk upper				
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst
3540C/8082	Aroclor-1016	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1221	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1232	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1242	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1248	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1254	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1260	23000	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1262	ND	1000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1268	ND	1000	mg/Kg	11/21/2011	ehernandez
Client Sample Description		2	Collected:	11/10/2011	Lab ID:	0002
		win fr caulk upper				
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst
3540C/8082	Aroclor-1016	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1221	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1232	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1242	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1248	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1254	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1260	25000	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1262	ND	1400	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1268	ND	1400	mg/Kg	11/21/2011	ehernandez
Client Sample Description		3	Collected:	11/10/2011	Lab ID:	0003
		win fr caulk Lower c small windows				
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst
3540C/8082	Aroclor-1016	ND	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1221	ND	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1232	ND	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1242	ND	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1248	ND	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1254	ND	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1260	54000	2000	mg/Kg	11/21/2011	ehernandez
3540C/8082	Aroclor-1262	ND	2000	mg/Kg	11/21/2011	ehernandez

 EMSL**EMSL Analytical, Inc.**

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

 EMSL

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Customer ID: UEC63
Customer PO:
Received: 11/11/11 11:00 AM
EMSL Order: 011105790

Fax: (508) 628-5488 Phone: (508) 628-5486
Project: Worcester

Analytical Results

Client Sample Description **3**
win fr caulk Lower c small windows

Collected: 11/10/2011 *Lab ID:* 0003

Method
3540C/8082

Parameter
Aroclor-1268

<i>Result</i>	<i>Reporting Limit</i>	<i>Units</i>	<i>Analysts Date</i>	<i>Analyst</i>
ND	2000	mg/Kg	11/21/2011	ehernandez

Definitions:

ND - indicates that the analyte was not detected at the reporting limit

EMSL Analytical Inc.

PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

Lab Name: EMSL Analytical		Customer Sample#: MB 1 4112 CU
EMSL Sample ID:		Project:
Lab File ID: X15382.D		Sample Matrix: Soil
Instrument ID: ECD-X		Sampling Date: 12:00:00 AM
Analyst: EH		Date Extracted: 11/18/2011
GC Column: CLPest I (0.25 mm)		Analysis Date: 11/21/2011 11:44:00 AM
GC Column 2: CLPest II (0.25 mm)		Sample wt/vol: 10 G
% Moisture: 0		Dilution Factor: 1
PH: 0		Concentrated Extract Vol: 10 (mL)
GPC Cleanup(Y/N): N		Injection Volume: 1 (ul)
Extraction Type: 3540C		Sulfur Cleanup: N
Method: SW846 8011		

CAS NO	COMPOUND	Report Limit (mg/Kg)	CONC. (mg/Kg)	Q
12674-11-2	Aroclor 1016	0.050		U
11104-28-2	Aroclor 1221	0.050		U
11141-16-5	Aroclor 1232	0.050		U
53469-21-9	Aroclor 1242	0.050		U
12672-29-6	Aroclor 1248	0.050		U
11097-69-1	Aroclor 1254	0.050		U
11096-82-5	Aroclor 1260	0.050		U
37324-23-5	Aroclor 1262	0.050		U
11100-14-4	Aroclor 1268	0.050		U

Qualifier Definitions

U = Undetected

B = Compound detected in method blank

E = Estimated value

D = Dilution

P = Results between the two columns differ >40%

EMSL Analytical Inc.*solid* SOIL PESTICIDE/PCB LCS/QCS/ LFB RECOVERY

Lab Name: EMSL Analytical Original LCS 14112							
File ID: X15382.D/X15383.D							
* : Values outside of							
	COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	SPIKE ADDED mg/Kg	LCS CONC. mg/Kg	LCS REC%
1	Aroclor 1016	12674-11-2	31	122	1.50	1.25	84
2	Aroclor 1260	11098-82-5	33	130	1.50	1.40	93
Total Out							0 of 2

EMSL Analytical Inc.

Solid SOIL PESTICIDE/PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:		EMSL Analytical		Original		5790-2 PCB MS 2X							
				File ID:		X15410.D\X15398.D\X15397.D							
* : Values outside of													
	COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	RPD LIMIT	SAMPLE CONC.	MS SPIKE ADDED mg/Kg	MS CONC. mg/Kg	MS REC%	MSD SPIKE ADDED mg/Kg	MSD CONC. mg/Kg	MSD REC%	RPD %
1	Aroclor 1016	12674-11-2	12	164	25	0.00	7.35	5.24	71	7.32	5.01	68	4
2	Aroclor 1260	11096-82-5	43	167	25	24700	7.35	6400	-249155 *	7.32	6140	-253924 *	0
Total Out									1 of 2			1 of 2	0 of 2

* The matrix spike/matrix spike duplicate (MS/MSD) recoveries fell outside control limit due to high concentration of Aroclor 1260 in the unspiked sample. The laboratory control sample (LCS) recoveries fell within control limits.

10-day

for
PCB

Worcester State College
LRC Bldg

Town/City: Worcester Building Name: 222 2nd

- 1
- 2
- 3

Received By: [Signature] Date: 11/11/11 11:00 am

EMSL Analytical, Inc.

<http://www.emsl.com>

3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: (856) 858-4571

EMSL

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488

12/22/2011

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 12/16/2011. The results are tabulated on the attached data pages for the following client designated project:

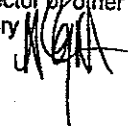
Worcester State University exterior brick

The reference number for these samples is EMSL Order #011106276. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:



Julie Smith - Laboratory Director or other approved
signatory



The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.

NELAP Certifications: NJ 04653, NY 10896, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

EMSL

EMSL Analytical, Inc.

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

EMSL

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Fax: (508) 628-5488 Phone: (508) 628-5486

Project: **Worcester State University exterior brick**

Customer ID: UEC63
 Customer PO:
 Received: 12/16/11 10:00 AM
 EMSL Order: 011106276

Analytical Results

Client Sample Description		1	Collected:	12/14/2011	Lab ID:	0001
		exterior brick 3 inches 2nd Fl Stair B				
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst
3540C/8082	Aroclor-1016	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1221	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1232	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1242	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1248	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1254	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1260	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1262	ND	0.61	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1268	ND	0.61	mg/Kg	12/19/2011	ehernandez

Client Sample Description		2	Collected:	12/14/2011	Lab ID:	0002
		exterior brick 4 inches 2nd Fl Stair B				
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst
3540C/8082	Aroclor-1016	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1221	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1232	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1242	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1248	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1254	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1260	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1262	ND	0.49	mg/Kg	12/19/2011	ehernandez
3540C/8082	Aroclor-1268	ND	0.49	mg/Kg	12/19/2011	ehernandez

Definitions:

ND - Indicates that the analyte was not detected at the reporting limit

EMSL Analytical Inc.

PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

Lab Name: EMSL Analytical		Customer Sample#: MB 1 4142 CU	
EMSL Sample ID:		Project:	
Lab File ID: Y15473.D		Sample Matrix:	Solid/Soil
Instrument ID: ECD-Y		Sampling Date:	12/00:00 AM
Analyst: EH		Date Extracted:	12/17/2011
GC Column: CLPest I (0.25 mm)		Analysis Date:	12/19/2011 1:07:14 PM
GC Column 2: CLPest II (0.25 mm)		Sample wt/vol:	10 G
% Moisture: 0		Dilution Factor:	1
PH: 0		Concentrated Extract Vol:	10 (mL)
GPC Cleanup(Y/N): N		Injection Volume:	1 (ul)
Extraction Type: 3540C		Sulfur Cleanup:	N
Method: SW846 8081/8082			

GAS NO	COMPOUND	Report Limit (mg/Kg)	CONC. (mg/Kg)	Q
12674-11-2	Aroclor 1016	0.050		U
11104-28-2	Aroclor 1221	0.050		U
11141-16-5	Aroclor 1232	0.050		U
53469-21-9	Aroclor 1242	0.050		U
12672-29-6	Aroclor 1248	0.050		U
11097-69-1	Aroclor 1254	0.050		U
11096-82-5	Aroclor 1260	0.050		U
37324-23-5	Aroclor 1262	0.050		U
11100-14-4	Aroclor 1268	0.050		U

Qualifier Definitions
 U = Undetected
 B = Compound detected in method blank
 E = Estimated value
 D = Dilution
 P = Results between the two columns differ >40%

EMSL Analytical Inc.*Soil* **SOIL PESTICIDE/PCB LCS/QCS/ LFB RECOVERY**

Lab Name: EMSL Analytical Original LCS 14142 File ID: Y15473.D/Y15474.D * : Values outside of							
	COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	SPIKE ADDED mg/Kg	LCS CONC. mg/Kg	LCS REC%
1	Aroclor 1018	12674-11-2	31	122	1.50	1.25	83
2	Aroclor 1260	11096-82-5	33	130	1.50	1.31	87
Total Out							0 of 2

EMSL Analytical Inc.

Sailed SOIL PESTICIDE/PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:		EMSL Analytical		Original		6276-1 PCB MS 10X						
				File ID:		Y15477.D\Y15475.D\Y15476.D						
* : Values outside of												
COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	RPD LIMIT	SAMPLE CONC.	MS SPIKE ADDED mg/Kg	MS CONC. mg/Kg	MS REC%	MSD SPIKE ADDED mg/Kg	MSD CONC. mg/Kg	MSD REC%	RPD %
1 Aroclor 1016	12674-11-2	12	164	25	0.00	2.22	2.28	102	2.25	2.38	106	4
2 Aroclor 1260	11096-82-5	43	167	25	0.00	2.22	2.22	100	2.25	2.40	107	6
Total Out								0 of 2			0 of 2	0 of 2

Printed: 12/20/11 02:48:36 PM
 SampleList: QC Batch 4142-1
 ERM: T:\ERMs\8081-8082\8082soil.erm

FORM III PEST_2



Phone: 508.628.5486
Fax: 508.628.5488

BUILDING / SITE NAME: Worcester State University TOWN / CITY: Worcester
WORK AREA: exterior Brick STATE: MA

Specific Project Notes

Test for PCBs brick
5-dy turn around.

RECEIVED

DATE/TIME:

DATE/TIME:

EMSL Analytical, Inc.

<http://www.emsl.com>

200 Route 130 North
Cinnaminson, NJ 08077
Phone: (856) 858-4800
Fax: (856) 858-4571

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

2/3/2012

Phone: (508) 628-5486
Fax: (508) 628-5488

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 12/28/2011. The results are tabulated on the attached data pages for the following client designated project:

Worcester State U LRC soil

The reference number for these samples is EMSL Order #011106421. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:



Julie Smith - Laboratory Director or other approved
signatory



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 04853, NY 10896, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

Revised Report- The PCB method was revised due to a typographical error. -- Original Report 12/30/11
Samples were received in plastic containers and above the temperature requirements.

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Customer ID: UEC63
Customer PO:
Received: 12/28/11 10:30 AM
EMSL Order: 011106421

Fax: (508) 628-5488 Phone (508) 628-5486

Project: **Worcester State U LRC soil****Analytical Results**

Client Sample Description 1 **Collected:** 12/26/2011 **Lab ID:** 0001
by Loading dock

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
SM 2540G	Total Solids	77	0.10	%	12/29/2011	Ivu
3540C/8082A	Aroclor-1016	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1221	ND	850	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1232	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1242	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1248	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1254	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1260	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1262	ND	650	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1268	ND	650	µg/Kg	12/30/2011	tlindsay

Client Sample Description 2 **Collected:** 12/26/2011 **Lab ID:** 0002
Right of Lower entrance

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
SM 2540G	Total Solids	78	0.10	%	12/29/2011	Ivu
3540C/8082A	Aroclor-1016	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1221	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1232	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1242	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1248	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1254	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1260	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1262	ND	660	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1268	ND	660	µg/Kg	12/30/2011	tlindsay

Client Sample Description 3 **Collected:** 12/26/2011 **Lab ID:** 0003
Left of Lower entrance

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
SM 2540G	Total Solids	74	0.10	%	12/29/2011	Ivu
3540C/8082A	Aroclor-1016	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1221	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1232	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1242	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1246	ND	870	µg/Kg	12/30/2011	tlindsay

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Customer ID: UEC63
Customer PO:
Received: 12/28/11 10:30 AM
EMSL Order: 011106421

Fax: (508) 628-5488 Phone (508) 628-5486

Project: **Worcester State U LRC soil****Analytical Results**

Client Sample Description 3 *Collected:* 12/26/2011 *Lab ID:* 0003
Left of Lower entrance

<i>Method</i>	<i>Parameter</i>	<i>Result</i>	<i>Reporting</i>		<i>Analysis Date</i>	<i>Analyst</i>
			<i>Limit</i>	<i>Units</i>		
3540C/8082A	Aroclor-1254	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1260	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1262	ND	670	µg/Kg	12/30/2011	tlindsay
3540C/8082A	Aroclor-1268	ND	670	µg/Kg	12/30/2011	tlindsay

Definitions:

ND - indicates that the analyte was not detected at the reporting limit



Phone: 508.628.5486
Fax: 508.628.5488

CHAIN OF CUSTODY

[illegible]

EMSL Analytical, Inc.

<http://www.emsl.com>

200 Route 130 North
Cinnaminson, NJ 08077
Phone: (856) 858-4800
Fax: (856) 858-4571

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Phone: (508) 628-5486
Fax: (508) 628-5488

2/13/2012

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 2/8/2012. The results are tabulated on the attached data pages for the following client designated project:

Worcester State University

The reference number for these samples is EMSL Order #011200582. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:



Julie Smith - Laboratory Director or other approved
signatory



The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 04653, NY 10896, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 858-4800 Fax: (856) 858-4571 Email: jsmith@emsl.com

Attn: **Ammar Dieb**
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Fax: (508) 628-5488

Phone (508) 628-5486

Project: **Worcester State University**

Customer ID: UEC63

Customer PO:

Received: 02/08/12 9:45 AM

EMSL Order: 011200562

Analytical Results

Client Sample Description 1
exterior brick Room 136B
Collected: 2/7/2012 **Lab ID:** 0001

Method	Parameter	Reporting			Analysis Date	Analyst
		Result	Limit	Units		
3540C/8082A	Aroclor-1016	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1221	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1232	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1242	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1248	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1254	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1260	0.65	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1262	ND	0.49	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1268	ND	0.49	mg/Kg	2/10/2012	ehernandez

Client Sample Description 2
interior brick 2nd Fl. Stair C
Collected: 2/7/2012 **Lab ID:** 0002

Method	Parameter	Reporting			Analysis Date	Analyst
		Result	Limit	Units		
3540C/8082A	Aroclor-1016	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1221	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1232	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1242	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1248	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1254	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1260	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1262	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1268	ND	0.50	mg/Kg	2/10/2012	ehernandez

Client Sample Description 3
exterior brick 2nd Fl. Stair C
Collected: 2/7/2012 **Lab ID:** 0003

Method	Parameter	Reporting			Analysis Date	Analyst
		Result	Limit	Units		
3540C/8082A	Aroclor-1016	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1221	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1232	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1242	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1248	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1254	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1260	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1262	ND	0.50	mg/Kg	2/10/2012	ehernandez

**EMSL Analytical, Inc.**

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Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Customer ID: UEC63
Customer PO:
Received: 02/08/12 9:45 AM
EMSL Order: 011200582

Fax: (508) 628-5488 Phone (508) 628-5486
Project: Worcester State University

Analytical Results

Client Sample Description 3 exterior brick 2nd Fl. Stair C **Collected:** 2/7/2012 **Lab ID:** 0003

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
3540C/8082A	Aroclor-1268	ND	0.50	mg/Kg	2/10/2012	ehernandez

Client Sample Description 4 exterior brick Room 219 **Collected:** 2/7/2012 **Lab ID:** 0004

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
3540C/8082A	Aroclor-1016	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1221	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1232	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1242	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1248	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1254	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1260	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1262	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1268	ND	0.50	mg/Kg	2/10/2012	ehernandez

Client Sample Description 5 exterior brick 2nd Fl. Stair B **Collected:** 2/7/2012 **Lab ID:** 0005

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
3540C/8082A	Aroclor-1016	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1221	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1232	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1242	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1248	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1254	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1260	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1262	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1268	ND	0.50	mg/Kg	2/10/2012	ehernandez

Client Sample Description 6 interior brick 2nd Fl. Stair B **Collected:** 2/7/2012 **Lab ID:** 0006

Method	Parameter	Result	Reporting		Analysis Date	Analyst
			Limit	Units		
3540C/8082A	Aroclor-1016	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1221	ND	0.50	mg/Kg	2/10/2012	ehernandez

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Project: **Worcester State University**

Analytical Results

Client Sample Description 6 *Collected:* 2/7/2012 *Lab ID:* 0006
interior brick 2nd Fl. Stair B

<i>Method</i>	<i>Parameter</i>	<i>Result</i>	<i>Reporting</i>		<i>Analysis Date</i>	<i>Analyst</i>
			<i>Limit</i>	<i>Units</i>		
3540C/8082A	Aroclor-1232	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1242	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1248	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1254	0.72	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1260	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1262	ND	0.50	mg/Kg	2/10/2012	ehernandez
3540C/8082A	Aroclor-1268	ND	0.50	mg/Kg	2/10/2012	ehernandez

Definitions:

ND - indicates that the analyte was not detected at the reporting limit

EMSL Analytical Inc.

PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

Lab Name: EMSL Analytical		Customer Sample#: MB 1 4221 CU
EMSL Sample ID:		Project:
Lab File ID: X16891.D		Sample Matrix: Solid/Soil
Instrument ID: ECD-X		Sampling Date: 12:00:00 AM
Analyst: EH		Date Extracted: 2/9/2012
GC Column: CLPest I (0.25 mm)		Analysis Date: 2/10/2012 1:44:33 PM
GC Column 2: CLPest II (0.25 mm)		Sample wt/vol: 10 G
% Moisture: 0		Dilution Factor: 1
PH: 0		Concentrated Extract Vol: 10 (mL)
GPC Cleanup(Y/N): N		Injection Volume: 1 (ul)
Extraction Type: 3540C		Sulfur Cleanup: N
Method: SW846 8081/8082		

CAS NO	COMPOUND	Report Limit (mg/Kg)	CONC. (mg/Kg)	Q
12674-11-2	Aroclor 1016	0.050		U
11104-28-2	Aroclor 1221	0.050		U
11141-16-5	Aroclor 1232	0.050		U
53469-21-9	Aroclor 1242	0.050		U
12672-29-6	Aroclor 1248	0.050		U
11097-69-1	Aroclor 1254	0.050		U
11096-82-5	Aroclor 1260	0.050		U
37324-23-5	Aroclor 1262	0.050		U
11100-14-4	Aroclor 1268	0.050		U

Qualifier Definitions
 U = Undetected
 B = Compound detected in method blank
 E = Estimated value
 D = Dilution
 P = Results between the two columns differ >40%

EMSL Analytical Inc.

Solid SOIL PESTICIDE/PCB LCS/QCS/ LFB RECOVERY

Lab Name:		EMSL Analytical		Original		LCS 1 4221	
				File ID:		X16891.D/X16892.D	
* : Values outside of							
	COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	SPIKE ADDED mg/Kg	LCS CONC. mg/Kg	LCS REC%
1	Aroclor 1016	12674-11-2	58	123	1.50	1.25	83
2	Aroclor 1260	11096-82-5	63	131	1.50	1.32	88
Total Out							0 of 2

EMSL Analytical Inc.

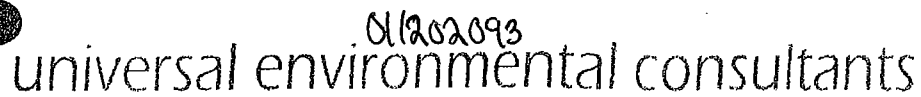
Soil SOIL PESTICIDE/PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:		EMSL Analytical		Original		0582-5 PCB MS 10X						
		File ID:		X16899.D\X16893.D\X16894.D								
* : Values outside of												
COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	RPD LIMIT	SAMPLE CONC.	MS SPIKE ADDED mg/Kg	MS CONC. mg/Kg	MS REC%	MSD SPIKE ADDED mg/Kg	MSD CONC. mg/Kg	MSD REC%	RPD %
1 Aroclor 1016	12674-11-2	12	164	25	0.00	1.49	1.33	89	1.49	1.38	92	3
2 Aroclor 1260	11096-82-5	43	167	25	0.00	1.49	1.49	100	1.49	1.43	96	4
Total Out								0 of 2			0 of 2	0 of 2



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[illegible]



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STATE: *MA*

DATE/TIME:

EMSL Analytical, Inc.

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Attn: **Ammar Dieb**
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12 Brewster Road
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Phone: (508) 628-5486
Fax: (508) 628-5488

5/14/2012

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 5/10/2012. The results are tabulated on the attached data pages for the following client designated project:

Worcester State U Worcester MA

The reference number for these samples is EMSL Order #011202093. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:



Julie Smith - Laboratory Director or other approved
signatory



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10896, PA 68-00367

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

The PCB samples were received in plastic containers and outside the temperature requirement.

**EMSL Analytical, Inc.**

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Framingham, MA 01702

Fax: (508) 628-5488

Phone (508) 628-5486

Project: **Worcester State U Worcester MA**

Customer ID: UEC63

Customer PO:

Received: 05/10/12 10:30 AM

EMSL Order: 011202093

Analytical Results

Client Sample Description		1	Collected:		5/8/2012	Lab ID: 0001	
		1st Floor Room 104					
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst	
3540C/8082A	Aroclor-1016	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1221	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1232	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1242	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1248	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1254	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1260	1000	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1262	ND	63	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1268	ND	63	mg/Kg	5/14/2012	ehernandez	
Client Sample Description		2	Collected:		5/8/2012	Lab ID: 0002	
		2nd Floor Stair C					
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst	
3540C/8082A	Aroclor-1016	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1221	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1232	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1242	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1248	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1254	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1260	ND	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1262	950	77	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1268	ND	77	mg/Kg	5/14/2012	ehernandez	
Client Sample Description		3	Collected:		5/8/2012	Lab ID: 0003	
		2nd Floor Room 219					
Method	Parameter	Result	Reporting Limit	Units	Analysis Date	Analyst	
3540C/8082A	Aroclor-1016	ND	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1221	ND	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1232	ND	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1242	ND	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1248	ND	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1254	ND	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1260	6.2	0.52	mg/Kg	5/14/2012	ehernandez	
3540C/8082A	Aroclor-1262	ND	0.52	mg/Kg	5/14/2012	ehernandez	

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Customer ID: UEC63
Customer PO:
Received: 05/10/12 10:30 AM
EMSL Order: 011202093

Fax: (508) 628-5488 Phone (508) 628-5486

Project: **Worcester State U Worcester MA****Analytical Results**

Client Sample Description		3	Collected:		5/8/2012	Lab ID: 0003	
		2nd Floor Room 219					

EMSL Analytical Inc.

PESTICIDE/PCB ORGANICS ANALYSIS DATA SHEET

Lab Name: EMSL Analytical		Customer Sample#: MB 1 4349 CU
EMSL Sample ID:		Project:
Lab File ID: X19198.D		Sample Matrix: Solid/Soil
Instrument ID: ECD-X		Sampling Date: 12:00:00 AM
Analyst: EH		Date Extracted: 5/11/2012
GC Column: CLPest I (0.25 mm)		Analysis Date: 5/14/2012 10:13:00 AM
GC Column 2: CLPest II (0.25 mm)		Sample wt/vol: 10 G
% Moisture: 0		Dilution Factor: 1
PH: 0		Concentrated Extract Vol: 10 (mL)
GPC Cleanup(Y/N): N		Injection Volume: 1 (ul)
Extraction Type: 3540C		Sulfur Cleanup: N
Method: SW846 8081/8082		

CAS NO	COMPOUND	Report Limit (mg/Kg)	CONC. (mg/Kg)	Q
12674-11-2	Aroclor 1016	0.050		U
11104-28-2	Aroclor 1221	0.050		U
11141-16-5	Aroclor 1232	0.050		U
53469-21-9	Aroclor 1242	0.050		U
12672-29-6	Aroclor 1248	0.050		U
11097-69-1	Aroclor 1254	0.050		U
11096-82-5	Aroclor 1260	0.050		U
37324-23-5	Aroclor 1262	0.050		U
11100-14-4	Aroclor 1268	0.050		U

Qualifier Definitions
 U = Undetected
 B = Compound detected in method blank
 E = Estimated value
 D = Dilution
 P = Results between the two columns differ >40%

EMSL Analytical Inc.**SOLID/SOIL PESTICIDE/PCB LCS/QCS/ LFB RECOVERY**

Lab Name: <u>EMSL Analytical</u> Original <u>LCS 1 4349</u> File ID: <u>X19198.D/X19199.D</u> * : Values outside of							
	COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	SPIKE ADDED mg/Kg	LCS CONC. mg/Kg	LCS REC%
1	Aroclor 1016	12674-11-2	31	122	1.50	1.41	94
2	Aroclor 1260	11096-82-5	33	130	1.50	1.45	97
Total Out							0 of 2

EMSL Analytical Inc.


SOLID/SOIL PESTICIDE/PCB MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:		EMSL Analytical		Original		2124-15 PCB MS 4X							
		File ID:		X19202.D\X19200.D\X19201.D									
* : Values outside of													
	COMPOUND	CAS NO	LOW LIMIT	HIGH LIMIT	RPD LIMIT	SAMPLE CONC.	MS SPIKE ADDED mg/Kg	MS CONC. mg/Kg	MS REC%	MSD SPIKE ADDED mg/Kg	MSD CONC. mg/Kg	MSD REC%	RPD %
1	Aroclor 1016	12674-11-2	12	164	25	0.00	3.70	3.42	92	3.61	3.53	98	6
2	Aroclor 1260	11096-82-5	43	167	25	0.00	3.70	3.42	92	3.61	3.48	96	4
Total Out									0 of 2			0 of 2	0 of 2

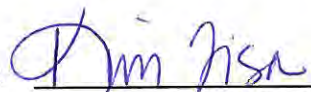
APPENDIX C

**STANDARD OPERATING PROCEDURE
FOR SAMPLING POROUS SURFACES
FOR POLYCHLORINATED BIPHENYLS (PCBs)**

**The Office of Environmental Measurement and Evaluation
EPA New England – Region 1
11 Technology Dr.
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Prepared by: 
Dan Granz, Environmental Engineer


5/5/11
Date

Reviewed by: 
Kim Tisa, TSCA PCB Coordinator

5/5/11
Date

Reviewed by: 
Jerry Keefe – EIA Team Leader

05/23/11
Date

Approved by: 
Dan Boudreau, EIA Chemistry Team Leader

5/23/11
Date

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Attachments:

Example of Custody Seal and Sample Label
Example of Chain of Custody Form

1.0 Scope and Application

- 1.1 This Standard Operating Procedure (SOP) is suitable for collection of a porous matrix sample for analysis of Polychlorinated Biphenyls (PCBs).
- 1.2 This SOP describes sampling techniques for both hard and soft porous surfaces.
 - 1.2.1 Hard surfaces, and most soft surfaces, can be sampled using an impact hammer drill to generate a uniform, finely ground, powder to be extracted and analyzed for PCBs. This procedure is primarily geared at providing enough sample quantity for two analyses. Hard porous surfaces include concrete, brick, asphalt, cement, sandstone, limestone, unglazed ceramics, and other possible PCB suspected material. This procedure may also be used on other softer porous surfaces, such as wood.
 - 1.2.2 Soft surfaces can be sampled using a chisel or sharp knife to generate a representative sample to be extracted and analyzed for PCBs. Soft porous surfaces include wood, wall plasterboard, low density plastics, rubber, caulking, and other PCB suspected material.
- 1.3 This SOP provides for collection of surface samples (0 – 0.5 inches) and delineation of PCB contamination throughout the core of the porous surface. The procedure can be used to sample the porous surface at distinctly different depth zones.

2.0 Method Summary

A one-inch or other sized diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine powder, or other representative sample, suitable for extraction and analysis of PCBs from porous surfaces. This method also allows the use of chisels or knives for the collection of samples from soft porous surfaces for PCB analysis.

3.0 Definitions

- 3.1 Field/Bottle Blank: A sample container of the same lot as the containers used for the environmental samples. This evaluates PCB contamination introduced from the sample container(s) from a common lot.
- 3.2 Equipment/Rinse/Rinsate Blanks: A sample that is collected by pouring hexane over the sample collection equipment after decontamination and before sample collection. The sample is collected in the appropriate sample container identical to the sample containers. This represents background contamination resulting from the field equipment, sampling procedure, sample container, and shipment.

- 3.3 Field Replicates/Duplicates: Two or more samples collected at the same sampling location. Field replicates should be samples collected side by side. Field replicates represent the precision of the whole method, site heterogeneity, field sampling, and the laboratory analysis.
- 3.4 Field Split Samples: Two or more representative subsamples taken from one environmental sample in the field. Prior to splitting, the environmental sample is homogenized to correct for sample heterogeneity that would adversely impact data comparability. Field split samples are usually analyzed by different laboratories (interlaboratory comparison) or by the same laboratory (intralaboratory comparison). Field splits are used to assess sample handling procedures from field to laboratory and laboratory comparability.
- 3.5 Laboratory Quality Samples: Additional samples that will be collected for the laboratory's quality control program: matrix spike, matrix spike duplicate, laboratory duplicates, etc.
- 3.6 Proficiency Testing (PT)/Performance Evaluation (PE) Sample: A sample, the composition of which is unknown to the laboratory or analyst, provided to the analyst or laboratory to assess the capability to produce results within acceptable criteria. This is optional depending on the data quality objectives. If possible, it is recommended that the PE sample be of similar matrix as the porous surface(s) being sampled.
- 3.7 Porous Surface: Any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low density plastics such as Styrofoam and low density polyethylene; coated (varnished or painted) or uncoated wood; painted or unpainted concrete or cement; plaster; plasterboard; wallboard; rubber; caulking; fiberboard; chipboard; asphalt; or tar paper.
- 3.8 Shipping Container Temperature Blank: A water sample that is transported to the laboratory to measure the temperature of the samples in the cooler.

4.0 Health and Safety

- 4.1 Eye, respiratory, and hearing protection are required at all times during sample drilling. A properly fitted respirator is required for hard porous surface sampling. A respirator is recommended whenever there is a risk of inhalation of either particulate or volatilized PCBs during sampling.
- 4.2 All proper personal protection clothing and equipment must be worn.

4.3 When working with potentially hazardous materials or situations, follow EPA, OSHA, and specific health or safety procedures.

4.4 Care must be exercised when using an electrical drill and sharp cutting objects.

5.0 Interferences and Potential Problems

5.1 This sampling technique produces a finely ground uniform powder, which minimizes the physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition). Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

5.2 Nitrile gloves are recommended. Latex gloves must not be used due to possible phthalate contamination.

5.3 Interferences may result from using contaminated equipment, solvents, reagents, sample containers, or sampling in a disturbed area. The drill bit must be decontaminated between samples. (see Section 11.0.)

5.4 Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment.

6.0 Personnel Qualifications

6.1 All field samplers working at hazardous materials/waste sites are required to take a 40 hour health and safety training course prior to engaging in any field activities. Subsequently, an 8 hour refresher health and safety course is required annually.

6.2 The field sampler should be trained by an experienced sampler before initiating this procedure.

6.3 All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function.

7.0 Equipment and Supplies

7.1 This list varies with the matrix and if depth profiling is required

- Rotary impact hammer variable speed drill
- 1-inch or other suitable (1/2, 3/4, etc.) diameter carbide tip drill bits
- Steel chisel or sharp cutting knife, and hammer
- Brush and cloths to clean area
- Stainless steel scoopulas

Aluminum foil to collect the powder sample
1 quart Cubitainer with the top cut out to collect the powder sample
Aluminum weighing pans to collect the powder sample
Cleaned glass container (2 oz or 40 mL) with Teflon lined cap
Decontamination supplies: hexane, two small buckets, a scrub brush, detergent, deionized water, hexane squirt bottle, and paper towels
Dedicated vacuum cleaner with a disposable filter or a vacuum pump with a dust filter
Polyethylene tubing and Pasteur pipettes
Sample tags/labels, custody seals, and Chain-of-Custody form

8.0 Sampling Design

- 8.1 A sufficient number of samples must be collected to meet the data quality objectives of the project. If the source of the PCB contamination is regulated under the federal TSCA PCB Regulations at 40 CFR Part 761, the sampler should insure that the sampling design is sufficient to meet any investigation or verification sampling requirements. At a minimum, the following is recommended:

- 8.1.1 Suspected stained area (s) should be sampled.
- 8.1.2 At each separate location, collect at least 3 samples of each type of porous surface, regardless of the amount of each type of porous surface present.
- 8.1.3 In areas where PCB equipment was used or where PCBs were stored, samples should be collected at a frequency of 1 sample/100 square feet (ft²).

9.0 Sample Collection

9.1 Hard Porous Surfaces

- 9.1.1 Lock a 1-inch or another size diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. For easy identification, sample locations may be pre-marked using a marker or paint. (Note: the actual drilling point must not be marked.) Remove any debris with a clean brush or cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook.
- 9.1.2 Use a Cubitainer with the top cut off or aluminum foil to contain the powdered sample. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground powder that can be easily collected.

- 9.1.3 Samples should be collected at ½-inch depth intervals. Thus, the initial surface sample should be collected from 0 – 0.5 inches. A ½-inch deep hole generates about 10 grams (20 mL) of powder. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes for a PCB determination. It is strongly recommended that the analytical laboratory be consulted on the minimum sample size needed for PCB extraction and analysis.
- 9.1.4 Wall and Ceiling Sampling: A team of two samplers will be required for wall and ceiling sampling. The second person will hold a clean catch surface (e.g. an aluminum pan) below the drill to collect the falling powder. Alternatively, use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. For ceilings, the drill may be held at an angle to collect the powder. Thus the driller can be drilling at an angle while the assistant steadies the pan to catch the falling powder. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the drill's cooling vents. Caution must be taken to prevent obstruction of the drill's cooling vents.

9.2 Soft Porous Surfaces

- 9.2.1 The procedure for the hard porous surface may be used for certain soft porous surfaces, such as wood.
- 9.2.2 Samples should be collected at no more than ½-inch depth intervals using a metal chisel or sharp cutting knife. Thus, the initial surface sample should be collected from 0 – 0.5 inches. It is important to collect at least 10 grams for analysis.
- 9.2.3 For soft porous surfaces, such as caulking and rubber, a representative sample can be collected using a metal chisel or sharp cutting knife.

9.3 Multiple Depth Sampling

- 9.3.1 Multiple Depth Sampling may not be applicable to certain porous surfaces, such as caulking.
- 9.3.2 Collect the surface sample as outlined in Section 9.1 or 9.2.
- 9.3.3 Use the vacuum pump or cleaner to clean out the hole.
- 9.3.4 To collect multiple depths there are two options.

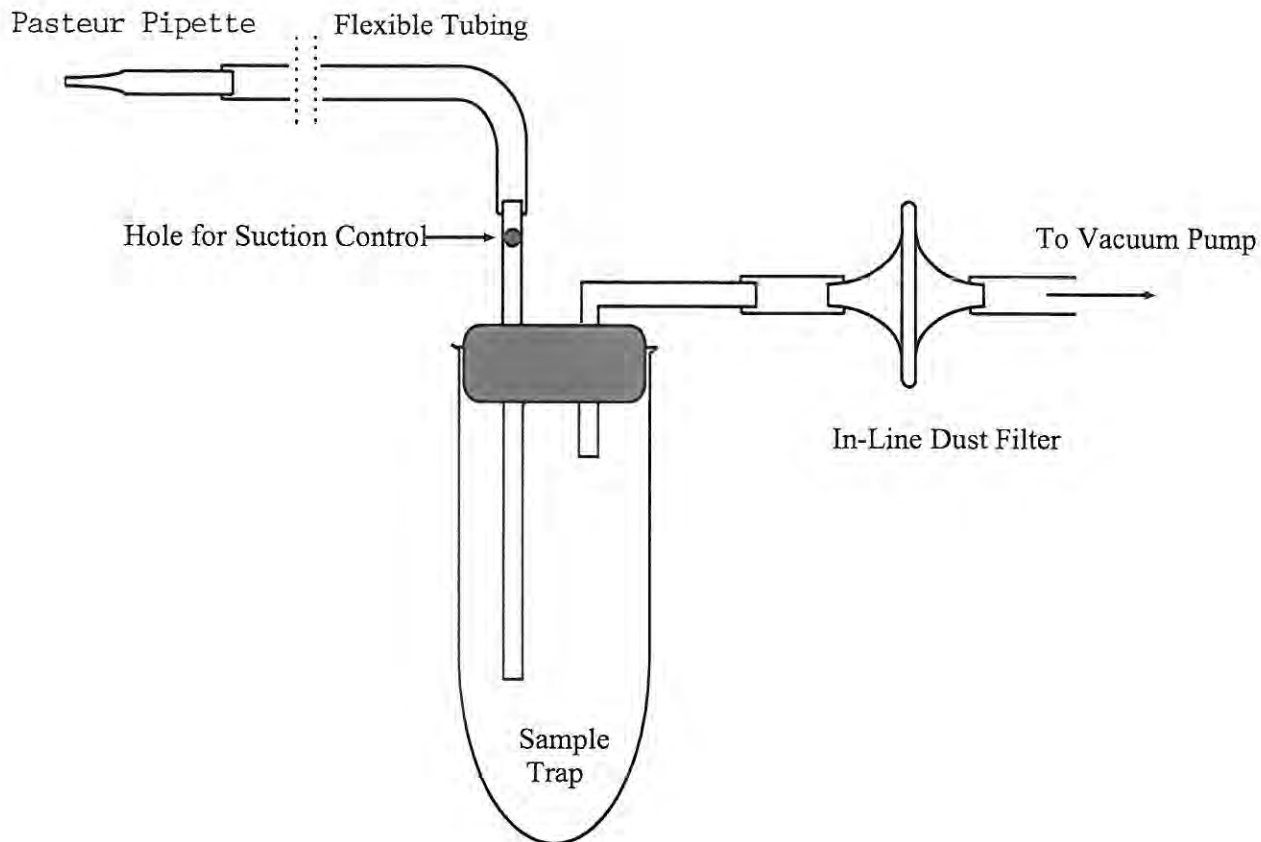
9.3.4.1 Option one: drill sequentially ½-inch increments with the 1 inch drill.

9.3.4.2 Option two: drill with the 1 inch bit and either make the hole larger or use a smaller bit to take the next ½- inch sample.

9.3.5 A stainless steel scoopula will make it easier to collect the sample from the bottom of the hole.

9.4 Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) the Pasteur pipette and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.

Figure 1

Note: the holes should be vacuumed thoroughly to minimize any cross-contamination between sample depths and the bits should be decontaminated between samples. (See Section 11.0)

10.0 Sample Handling, Preservation, and Storage

- 10.1 Samples must be collected in glass containers for PCB analyses. In general, a 2-ounce sample container with a Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient mass for most analyses. A 2-ounce jar can hold roughly 90 grams of sample.
- 10.2 Samples are to be shipped refrigerated and maintained at $\leq 6^{\circ}\text{C}$ until the time of extraction and analysis.
- 10.3 The suggested holding time for PCB samples is 14 days to extraction.

11.0 Decontamination

- 11.1 Assemble two decontamination buckets. The first bucket contains a detergent and potable water solution, and the second bucket is for rinsate. Place all used drill bits, hose for the vacuum cleaner, and utensils in the detergent and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece with water and hexane. Place the rinsed pieces on clean paper towels and individually dry and inspect each piece. Note: all pieces should be dry prior to reuse.
- 11.2 Lightly contaminated drill bits and utensils may be wiped with a hexane soaked cloth and hexane rinsed for decontamination.

12.0 Data and Record Management

- 12.1 All data and information collection should follow a Field Data Management SOP or Quality Assurance Project Plan (QAPP).
- 12.2 Follow the chain of custody procedures to release the samples to the laboratory. A copy is kept with the sampling records.
- 12.3 The field data is stored for at least 3 years.

13.0 Quality Control and Quality Assurance

- 13.1 Representative samples are required. The sampler will evaluate the site specific conditions to assure the sample will be representative.
- 13.2 All sampling equipment must be decontaminated prior to use and between each discrete sample.
- 13.3 All field Quality Control (QC) sample requirements in a Sample and Analysis Plan (SAP) or QAPP must be followed. The SAP or QAPP may involve field blanks, equipment blanks, field duplicates and/or the collection of extra samples for the laboratory's quality control program.
- 13.4 Field duplicates should be collected at a minimum frequency of 1 per 20 samples or 1 per non-related porous matrix, whichever is greater.

14.0 Waste Management and Pollution Prevention


- 14.1 During field sampling events there may be PCB and/or hazardous waste produced from the sample collection. The waste must be handled and disposed of in accordance with federal, state, and local regulations. The dust filter, and tubing if a vacuum pump is used, is disposed after each site investigation. This waste will be treated as PCB waste if the samples are positive for PCBs. It may be possible to manage or dispose of the waste produced at the site where the work was performed. If the site does not meet regulatory requirements for these types of activities, the waste must be transported to a facility permitted to manage and/or dispose of the waste.

15.0 References

1. Guidance for the Preparation of Standard Operating Procedures for Quality-Related Operations, QA/G-6, EPA/600/R-96/027, November 1995.
2. 40 CFR Part 761 – Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, and Use Prohibitions
3. Sample Container and Holding Time: RCRA SW 846, Chapter 4, Table 4.1, Revision 4, February, 2007.

Example of Sample Label and Custody Seal

U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION I BOSTON, MASS.	
LABEL	NAME OF UNIT AND ADDRESS ENVIRONMENTAL SERVICES DIVISION 60 WESTVIEW STREET LEXINGTON, MASSACHUSETTS 02173
	DATE: YR/MO/DAY TIME STATION NO.
SAMPLE	SOURCE OF SAMPLE SAMPLING CREW(FIRST, INITIAL, LAST NAME)
	SAMPLE NO.
	SUB NO.
	PRESERVATIVE <input checked="" type="checkbox"/>
	AMOUNT ANALYSIS

 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY OFFICIAL SAMPLE SEAL	SAMPLE NO.	DATE
	SIGNATURE	
	PRINT NAME AND TITLE (Inspector, Analyst or Technician)	
	SEAL BROKEN BY	DATE

EPA FORM 7500-2 (R7-75)

